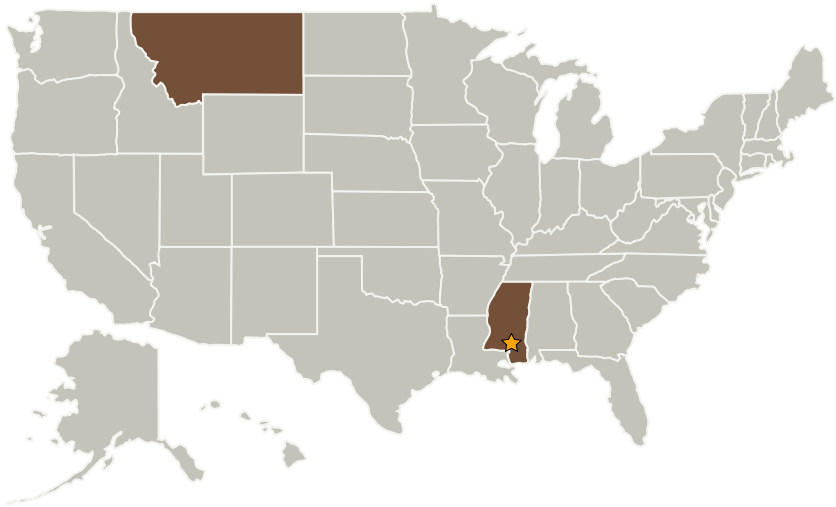
Automated Feature Extraction from Hyperspectral Imagery, Phase II

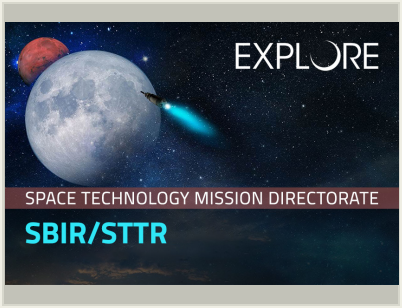
Completed Technology Project (2006 - 2008)

Project Introduction

The proposed activities will result in the development of a novel hyperspectral feature-extraction toolkit that will provide a simple, automated, and accurate approach to materials classification from hyperspectral imagery (HSI). The proposed toolkit will be built as an extension to the state-of-the-art technology in automated feature extraction (AFE), the Feature Analyst software suite, which was developed by the proposing company. Feature Analyst uses, along with spectral information, feature characteristics such as spatial association, size, shape, texture, pattern, and shadow in its generic AFE process. Incorporating the best AFE approach (Feature Analyst) with the best HSI techniques promises to greatly increase the usefulness and applicability of HSI. While current HSI techniques, such as spectral end-member classification, can provide effective materials classification, these methods are slow (or manual), cumbersome, complex for analysts, and are limited to materials classification only. Feature Analyst, on the other hand, has a simple workflow of (a) an analyst providing a few examples, and (b) an advanced software agent classifying the rest of the imagery. This simple yet powerful approach will become the new paradigm for HSI materials classification since Phase I experiments show it is (a) accurate, (b) simple, (c) advanced, and (d) exists as workflow extension to market leading products. The deliverables of this proposal will allow HSI products to be fully exploited for the first time by a wide range of users.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Visual Learning Systems, Inc.	Supporting Organization	Industry	Missoula, Montana

Primary U.S. Work Locations	
Mississippi	Montana

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.6 Repurpose Processes